List of Claims:

1. (currently amended) A method of improving synthesized speech quality in a speech coding system including an encoder and a decoder ~~operable in narrowband frequencies and wideband frequencies~~, said method comprising:

obtaining an input speech signal by said encoder;

coding said input speech signal by said encoder using a Code Excited Linear Prediction (CELP) coder to generate CELP coding parameters for synthesis of said input speech signal;

generating a plurality CELP speech frames by said encoder, each of said plurality CELP speech frames including said CELP coding parameters;

~~when said encoder is operating in said narrowband frequencies:~~

~~transmitting said CELP coding parameters as part of each of said plurality of CELP speech frames;~~

~~when said encoder is operating in said wideband frequencies:~~

~~classifying each of said plurality CELP speech frames into a plurality of classes, wherein each of said plurality of classes of said input speech signal represents a different degree of periodicity of said input speech signal, and wherein said plurality of classes of said input speech signal include a background noise class, an unvoiced class, a first voiced class, a second voiced class, wherein said first voiced class has a lower degree of periodicity than said second voiced class;~~

creating a plurality of voicing indexes by said encoder, wherein each of said plurality of voicing indexes <u>relates to a characteristic of said input speech signal</u> ~~specifically designates one~~

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~~of said plurality of classes of said input speech signal;~~ and

transmitting each of said plurality of voicing indexes as part of each of said plurality of

CELP speech frames and in addition to said CELP coding parameters <ins>including line spectral</ins>

<ins>frequencies, pitch, fixed codebook gain, adaptive codebook gain and fixed codebook parameters</ins>~~;~~

~~by said encoder to said decoder for specifically designating one of a plurality of classes~~

~~corresponding to each of said plurality of CELP speech frames, whereby enhancing said~~

~~synthesis of said input speech signal by said decoder.~~

2. (cancelled)

3. (previously presented) The method of claim 1, wherein at least one of said plurality of

voicing indexes provides information from said encoder to said decoder for controlling an

adaptive highpass filter by said decoder.

4. (previously presented) The method of claim 1, wherein at least one of said plurality of

voicing indexes provides information from said encoder to said decoder for controlling an

adaptive perceptual weighting filter by said decoder.

5. (previously presented) The method of claim 1, wherein at least one of said plurality of

voicing indexes provides information from said encoder to said decoder for controlling an

adaptive Sinc window by said decoder.

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6. (previously presented) The method of claim 1, wherein said at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling a spectrum tilt of said input speech signal by short-term enhancement of a fixed-codebook by said decoder.

7. (previously presented) The method of claim 1, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling a perceptual weighting filter by said decoder.

8. (previously presented) The method of claim 1, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling a linear prediction coder by said decoder.

9. (previously presented) The method of claim 1, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling a pitch enhancement fixed-codebook by said decoder.

10. (previously presented) The method of claim 1, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for by controlling a post pitch enhancement by said decoder.

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11. (previously presented) The method of claim 1, wherein at least one of said plurality of voicing indexes is for use by said decoder to select at least one sub-codebook from a plurality of sub-codebooks.

12. (currently amended) A method of improving synthesized speech quality in a speech coding system including an encoder and a decoder ~~operable in narrowband frequencies and wideband frequencies~~, said method comprising:

receiving a plurality of Code Excited Linear Prediction (CELP) speech frames by said decoder from said encoder;

obtaining a plurality of CELP coding parameters by decoding each of said plurality of CELP speech frames by said decoder;

~~when said decoder is operating in said narrowband frequencies:~~

~~generating a synthesized version of said input speech signal using said plurality of CELP coding parameters;~~

~~when said decoder is operating in said wideband frequencies:~~

obtaining a plurality of voicing indexes, in addition to said plurality of CELP coding parameters <u>including line spectral frequencies, pitch, fixed codebook gain, adaptive codebook gain and fixed codebook parameters</u>, by decoding each of said plurality of CELP speech frames by said decoder ~~for obtaining classification designation of said input speech signal by said encoder~~, wherein each of said plurality of voicing indexes <u>relates to a characteristic of said input speech signal</u> ~~specifically designates one of a plurality of classes of said input speech signal~~, ~~wherein each of said plurality of classes of said input speech signal represents a different degree~~

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~~of periodicity of said input speech signal, and wherein said plurality of classes of said input speech signal include a background noise class, an unvoiced class, a first voiced class, a second voiced class, wherein said first voiced class has a lower degree of periodicity than said second voiced class~~; and

generating said synthesized version of said input speech signal using said plurality of CELP coding parameters and said plurality of voicing indexes by said decoder.

13. (cancelled)

14. (previously presented) The method of claim 12, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling an adaptive highpass filter by said decoder.

15. (previously presented) The method of claim 12, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling an adaptive perceptual weighting filter by said decoder.

16. (previously presented) The method of claim 12, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling an adaptive Sinc window for pitch contribution by said decoder.

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17. (previously presented) The method of claim 12, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling a spectrum tilt of said input speech signal by short-term enhancement of a fixed-codebook by said decoder.

18. (previously presented) The method of claim 12, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling a linear prediction coder filter by said decoder.

19. (previously presented) The method of claim 12, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling a pitch enhancement fixed-codebook by said decoder.

20. (previously presented) The method of claim 12, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling a post pitch enhancement by said decoder.

21. (previously presented) The method of claim 12, wherein said decoder uses at least of said plurality of said voicing indexes selects at least one sub-codebook from a plurality of sub-codebooks.

22. (currently amended) An encoder ~~operable in narrowband frequencies and wideband~~

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~~frequencies~~ for improving synthesized speech quality of an input speech signal, said encoder

comprising:

a receiver configured to receive said input speech signal by said encoder;

a transmitter;

a Code Excited Linear Prediction (CELP) coder configured to:

generate CELP coding parameters for synthesis of said input speech

signal,

~~when said encoder is operating in said wideband frequencies:~~

generate a plurality CELP speech frames, each of said plurality

CELP speech frames including said CELP coding parameters,

~~classify each of said plurality CELP speech frames into a plurality~~

~~of classes, wherein each of said plurality of classes of said input speech~~

~~signal represents a different degree of periodicity of said input speech~~

~~signal, and wherein said plurality of classes of said input speech signal~~

~~include a background noise class, an unvoiced class, a first voiced class, a~~

~~second voiced class, wherein said first voiced class has a lower degree of~~

~~periodicity than said second voiced class;~~

create a plurality of voicing indexes, wherein each of said plurality

of voicing indexes <u>relates to a characteristic of said input speech signal</u>

~~specifically designates one of said plurality of classes of said input speech~~

~~signal~~;

~~when said encoder is operating in said narrowband frequencies~~

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~~said transmitter is configured to transmit said CELP coding parameters as~~

~~part of each of said plurality of CELP speech frames:~~

~~when said encoder is operating in said wideband frequencies:~~

said transmitter is configured to transmit each of said plurality of voicing

indexes as part of each of said plurality of CELP speech frames and in addition to

said CELP coding parameters <u>including line spectral frequencies, pitch, fixed</u>

<u>codebook gain, adaptive codebook gain and fixed codebook parameters,</u> ~~by said~~

~~encoder to a decoder for specifically designating one of a plurality of classes~~

~~corresponding to each of said plurality of CELP speech frames, whereby~~

~~enhancing said synthesis of said input speech signal by said decoder.~~

23. (cancelled)

24. (previously presented) The encoder of claim 22, wherein at least one of said plurality

of voicing indexes provides information from said encoder to said decoder for controlling an

adaptive highpass filter by said decoder.

25. (previously presented) The encoder of claim 22, wherein at least one of said plurality

of voicing indexes provides information from said encoder to said decoder for controlling an

adaptive perceptual weighting filter by said decoder.

26. (previously presented) The encoder of claim 22, wherein at least one of said plurality

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of voicing indexes provides information from said encoder to said decoder for controlling an adaptive Sinc window by said decoder.

27. (previously presented) The encoder of claim 22, wherein at least one of said plurality of voicing indexes is for use by said decoder to selects at least one sub-codebook from a plurality of sub-codebooks.

28. (currently amended) A decoder ~~operable in narrowband frequencies and wideband frequencies~~ for improving synthesized speech quality of an input speech signal, said method comprising:

a receiver configured to receive a plurality of Code Excited Linear Prediction (CELP) speech frames from an encoder based on said input speech signal,

wherein said decoder is configured to:

obtain a plurality of CELP coding parameters by decoding each of said plurality of CELP speech frames,

~~when said decoder is operating in said narrowband frequencies:~~

~~said decoder is configured to generate a synthesized version~~

~~of said input speech signal using said plurality of CELP coding~~

~~parameters;~~

~~when said decoder is operating in said wideband frequencies:~~

obtain a plurality of voicing indexes, in addition to said plurality of CELP coding parameters <u>including line spectral frequencies, pitch, fixed codebook gain,</u>

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adaptive codebook gain and fixed codebook parameters, by decoding each of said

plurality of CELP speech frames ~~to obtain classification designation of said input~~

~~speech signal by said encoder~~, wherein each of said plurality of voicing indexes

relates to a characteristic of said input speech signal ~~specifically designates one of~~

~~a plurality of classes of said input speech signal, wherein each of said plurality of~~

~~classes of said input speech signal represents a different degree of periodicity of~~

~~said input speech signal~~, wherein said decoder is configured to generate said

synthesized version of said input speech signal using said plurality of CELP

coding parameters and said plurality of voicing indexes~~, and wherein said plurality~~

~~of classes of said input speech signal include a background noise class, an~~

~~unvoiced class, a first voiced class, a second voiced class, wherein said first~~

~~voiced class has a lower degree of periodicity than said second voiced~~ class.

29. (cancelled)

30. (previously presented) The decoder of claim 28, wherein at least one of said plurality

of voicing indexes provides information from said encoder to said decoder for controlling an

adaptive highpass filter by said decoder.

31. (previously presented) The decoder of claim 28, wherein at least one of said plurality

of voicing indexes provides information from said encoder to said decoder for controlling an

adaptive perceptual weighting filter by said decoder.

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32. (previously presented) The decoder of claim 28, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling an adaptive Sinc window for pitch contribution by said decoder.

33. (previously presented) The decoder of claim 28, wherein said decoder uses at least of said plurality of said voicing indexes selects at least one sub-codebook from a plurality of sub-codebooks.

34. (previously presented) The method of claim 1, wherein each of said plurality of voicing indexes has a plurality of bits specifically designating said classification of each frame of said plurality of CELP speech frames.

35. (original) The method of claim 34, wherein said plurality of bits are three bits.

36. (original) The method of claim 34, wherein said classification is indicative of periodicity of said input speech signal.

37. (previously presented) The method of claim 12, wherein each of said plurality of voicing indexes has a plurality of bits specifically designating said classification of each frame of said plurality of CELP speech frames.

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38. (previously presented) The method of claim 37, wherein said plurality of bits are three bits.

39. (previously presented) The method of claim 37, wherein said classification is indicative of periodicity of said input speech signal.

40. (previously presented) The encoder of claim 22, wherein each of said plurality of voicing indexes has a plurality of bits specifically designating said classification of each frame of said plurality of CELP speech frames.

41. (previously presented) The encoder of claim 40, wherein said plurality of bits are three bits.

42. (previously presented) The encoder of claim 40, wherein said classification is indicative of a noisy speech signal.

43. (previously presented) The decoder of claim 28, wherein each of said plurality of voicing indexes has a plurality of bits specifically designating said classification of each frame of said plurality of CELP speech frames.

44. (previously presented) The decoder of claim 40, wherein said classification is indicative of a periodic index.

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45. (previously presented) The decoder of claim 40, wherein said periodic index ranges from a low periodic index to a high periodic index.

46. (previously presented) The method of claim 1, wherein said plurality of voicing indexes are used in place of pitch gain for post pitch enhancement.

47. (previously presented) The method of claim 5, wherein said plurality of voicing indexes are used to control a modification to a low pass filter for said Sinc window.

48. (previously presented) The method of claim 1, wherein each of said plurality of voicing indexes is derived from a normalized pitch correlation parameter Rp, where $-1.0 < Rp < 1.0$.

49. (previously presented) The method of claim 12, wherein each of said plurality of voicing indexes is derived from a normalized pitch correlation parameter Rp, where $-1.0 < Rp < 1.0$.

50. (new) The method of claim 1, wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for a bi-directional pitch enhancement.

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